

**U.S. DEPARTMENT OF ENERGY  
DEPARTMENT-WIDE  
FUNCTIONAL AREA QUALIFICATION STANDARD**

# **PROJECT MANAGEMENT QUALIFICATION STANDARD**



**U.S. Department of Energy  
Washington, D.C. 20585**

**May 1995**

### Approval and Concurrence

The Associate Deputy Secretary for Field Management is the Management Sponsor for the Department-wide Project Management Functional Area Qualification Standard. The Management Sponsor is responsible for reviewing the Qualification Standard to ensure that the technical content is accurate and adequate for Department-wide application. The Management Sponsor, in coordination with the Human Resources organization, is also responsible for ensuring that the Qualification Standard is maintained current. Concurrence with this Qualification Standard by the Associate Deputy Secretary for Field Management is indicated by the signature below.

The Technical Personnel Program Coordinator (TPPC) is responsible for coordinating the consistent development and implementation of the Technical Qualification Program throughout the Department of Energy. Concurrence with this Qualification Standard by the Technical Personnel Program Coordinator is indicated by the signature below.

The Technical Excellence Executive Committee (TEEC) consists of senior Department of Energy managers. This Committee is responsible for reviewing and approving the Qualification Standard for Department-wide application. Approval of this Qualification Standard by the Technical Excellence Executive Committee is indicated by the signature below.

**NOTE:** The signatures below reflect concurrence and approval of this Qualification Standard for interim Implementation. Final concurrence and approval will occur in December 1995, pending comments received based upon implementation.

#### CONCURRENCE:

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Associate Deputy Secretary for  
Field Management

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Technical Personnel Program  
Coordinator

#### APPROVAL:

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Chairman  
Technical Excellence Executive Committee

**CONTENTS**

PURPOSE .....1

APPLICABILITY .....1

IMPLEMENTATION REQUIREMENTS .....2

DUTIES AND RESPONSIBILITIES .....3

BACKGROUND AND EXPERIENCE .....4

REQUIRED COMPETENCIES.....5

    1.    GENERAL TECHNICAL .....5

    2.    REGULATORY .....8

    3.    ADMINISTRATIVE .....15

    4.    MANAGEMENT, ASSESSMENT, AND OVERSIGHT.....16

EVALUATION REQUIREMENTS.....28

CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS .....28

**U.S. DEPARTMENT OF ENERGY  
FUNCTIONAL AREA QUALIFICATION STANDARD**

**FUNCTIONAL AREA**

**Project Management**

**PURPOSE**

This Functional Area Qualification Standard establishes the Department-wide competency requirements for those personnel required to plan and execute projects in accordance with the Departmental Directives regarding Project Management. Requirements in this Qualification Standard also apply to personnel at defense nuclear facilities required to participate in the Technical Qualification Program.

The Technical Qualification Program is divided into three levels of technical competence and qualification. The General Technical Base Qualification Standard establishes the base technical competence required of all Department of Energy defense nuclear facility technical personnel. The Functional Area Qualification Standards build on the requirements of the General Technical Base Qualification Standard and establish Department-wide functional competence requirements in each of the identified functional areas. Office/facility-specific qualification standards establish unique operational competency requirements at the Headquarters or Field element, site, or facility level.

The Project Management Functional Area Qualification Standard establishes common functional area competency requirements for all project management personnel. Satisfactory and documented completion of the competency requirements contained in this Standard ensures that project management personnel possess the minimum requisite competence to fulfill related duties and responsibilities. Additionally, these competency requirements provide the functional foundation to assure successful completion of the appropriate Office/facility-specific requirements.

**APPLICABILITY**

This Standard applies to all Department of Energy project management personnel required to plan and execute projects in accordance with the Departmental Directives regarding project management. This Standard may be used as a stand-alone document or may be used in a complementary manner with other Qualifications Standards (e.g., Construction Management and Engineering or Civil/Structural Engineering) as determined by Office/Facility-Specific requirements. Personnel designated by Headquarters or Field element line management as participants in the Technical Qualification Program are required to meet the requirements of this Standard as defined in DOE Order 3410.

**IMPLEMENTATION REQUIREMENTS**

The competencies contained in the Standard are divided into the following four categories:

1. General Technical
2. Regulatory
3. Administrative
4. Management, Assessment, and Oversight

Each of the categories is defined by one or more competency statements indicated by bold print. The competency statements define the expected knowledge and/or skill that an individual must possess, and are requirements. Each competency statement is further explained by a listing of supporting knowledge and/or skill statements. The supporting knowledge and/or skill statements are not requirements and do not necessarily have to be fulfilled to meet the intent of the competency.

The competencies identify a familiarity level, working level, or expert level of knowledge; or, they require the individual to demonstrate the ability to perform a task or activity. These levels are defined as follows:

**Familiarity level** is defined as basic knowledge of or exposure to the subject or process adequate to discuss the subject or process with individuals of greater knowledge.

**Working level** is defined as the knowledge required to monitor and assess operations/activities, to apply standards of acceptable performance, and to reference appropriate materials and/or expert advice as required to ensure the safety of Departmental activities.

**Expert level** is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.

**Demonstrate the ability** is defined as the actual performance of a task or activity in accordance with policy, procedures, guidelines, and/or accepted industry or Department practices.

Headquarters and Field elements shall establish a program and process to ensure that all applicable personnel meet the competency requirements contained in this Standard. Documentation of the completion of the requirements of this Standard shall be included in the employee's training and qualification record.

In select cases, it may be necessary to exempt an individual from completing one or more of the competencies in this Functional Area Qualification Standard. Exemptions from individual competencies shall be justified and documented in accordance with DOE Order 3410. Exemptions shall be requested by the individual's immediate supervisor, and approved one level above the individual's immediate supervisor.

Equivalencies may be granted for individual competencies based upon an objective evaluation of the employee's prior education, experience, and/or training. Documentation of equivalencies shall indicate how the competency requirements have been met. The supporting knowledge

and/or skill statements may be considered when evaluating an individual's ability with respect to each competency requirement.

Training shall be provided to designated employees who do not meet the competencies contained in the qualification standard. Departmental training will be based upon supporting knowledge and/or skill statements similar to the ones listed for each of the competency statements. Headquarters and Field elements should use the supporting knowledge and/or skill statements as a basis for evaluating the content of any training courses used to provide individuals with the requisite knowledge and/or skill required to meet the qualification standard competency statements.

## **DUTIES AND RESPONSIBILITIES**

The following are duties and responsibilities normally expected of defense nuclear facility technical personnel assigned to the project management functional area:

- A. Manages all activities of assigned projects from assignment of a project through its completion.
- B. Reviews, evaluates, and monitors cost, schedule, and technical baseline execution.
- C. Monitors and oversees the detailed engineering, design, and construction work.
- D. Ensures the preparation of required project planning documentation.
- E. Participates in the project acquisition strategy as required.
- F. Ensures the preparation of reports to reflect project status, cost, schedule trends, manpower adequacy, funding, and project uncertainties.
- G. Conducts field inspection of work in progress and evaluates the performance of contractors using established baselines.
- H. Assures that the Environmental Safety and Health (ES&H) requirements and Quality Assurance requirements are properly implemented.
- I. Develops, reviews, and endorses the annual budget requests of the projects.
- J. Oversees the planning and coordination of the turnover of completed projects.

Additional duties and responsibilities specific to the site, the facility, the operational activities, and/or the involved organizations shall be contained in the facility-specific qualification standard(s).

## **BACKGROUND AND EXPERIENCE**

The U.S. Office of Personnel Management's Qualification Standards Handbook establishes minimum education, training, experience, or other relevant requirements applicable to a particular occupational series/grade level, as well as alternatives to meeting specified requirements.

The preferred education and experience for project management personnel is:

1. Education:

Bachelor of Science/Arts degree in a technical, scientific or management field; or meet the alternative requirements specified in the Qualifications Standards Handbook.

2. Experience:

Industrial, military, Federal, state or other directly related background that has provided specialized experience in project management. Specialized experience can be demonstrated through possession of the competencies outlined in this Standard.

## **REQUIRED COMPETENCIES**

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All project management personnel required to participate in the Technical Qualification Program must complete the competency requirements of the General Technical Base Qualification Standard prior to or in parallel with the completion of the competency requirements contained in this Standard.

Each of the competency statements defines the level of expected knowledge and/or skill that an individual is required to possess to meet the intent of this Standard. The supporting knowledge and/or skill statements further describe the intent of the competency statements but are not requirements.

## 1. GENERAL TECHNICAL

### 1.1 Project management personnel shall demonstrate a familiarity level knowledge of mechanical engineering theories, principles and techniques.

#### Supporting Knowledge and/or Skills

- a. Given a process instrumentation diagram and the technical specifications for a process system, describe the purpose of the system and the major flowpaths.
- b. Given a process instrumentation diagram and the technical specifications for a process system, describe the function of each of the major components of the system.
- c. Discuss the piping requirements for a given system application with respect to piping size, material and support.
- d. Describe the purpose and basic design of heating, ventilation and air conditioning (HVAC) systems for different applications.
- e. Describe the purpose and design of hydraulic/pneumatic systems for different applications.

### 1.2 Project management personnel shall demonstrate a familiarity level knowledge of electrical engineering theories, principles and techniques.

#### Supporting Knowledge and/or Skills

- a. State the purpose of each of the following major components used in a basic electrical transmission or distribution system:
  - Generator
  - Transformer
  - Load center and motor control center
  - Circuit breakers
  - Fuses
  - Protective relays
- b. Explain the reason for measuring temperature, pressure, flow and fluid level in a process system.
- c. Describe the functions that temperature, pressure, flow and fluid level detectors provide.

### 1.3 Project management personnel shall demonstrate a familiarity level knowledge of the application of civil engineering theories, principles and techniques.

#### Supporting Knowledge and/or Skills

- a. Discuss the basic concepts of architectural design.
- b. Discuss the basic concepts of structural design and integrity.
- c. Discuss the basic concepts of civil transportation design (roads, bridges, etc.)
- d. Describe the basic design requirements for sanitary systems.

**1.4 Project management personnel shall demonstrate the ability to read and interpret engineering fabrication, construction, and architectural drawings.**

Supporting Knowledge and/or Skills

- a. Given engineering fabrication, construction, and architectural drawings, determine the following:
  - Basic dimensional tolerances
  - Basic fabrication requirements
  - Basic construction requirements
  - Basic architectural requirements
- b. Given a drawing and a completed or partially completed product, compare the product against the specifications on the drawing.

**1.5 Project management personnel shall demonstrate a working level knowledge of computer applications used in project management.**

Supporting Knowledge and/or Skills

- a. Describe the project scheduling system used to track and report project status.
- b. Read and interpret computer-generated project reports.
- c. Describe the applications of computer-aided design (CAD) and computer-aided engineering (CAE) tools.

## 2. REGULATORY

**NOTE 1: When Department of Energy (DOE) directives are referenced in the qualification standard, the most recent revision should be used.**

**NOTE 2: Project managers not participating in the Technical Qualification Program are exempt from competency requirements 2.4, 2.5, and 2.6.**

**2.1 Project management personnel shall demonstrate a familiarity level knowledge of the following Department of Energy (DOE) Orders used to implement the Project Management System.**

- **DOE Order 4700.1, Project Management System**
- **DOE Order 4700.3, General Plant Projects**

Supporting Knowledge and/or Skills

- a. Discuss the purpose, scope, and application of the listed Orders, policies, and circulars. Include in this discussion the key terms, essential elements, and personnel responsibilities and authorities.
- b. Given an assigned project, identify the source documents necessary to effectively manage the project.
- c. Determine contractor compliance with the requirements of the above Orders.
- d. Using the appropriate Orders, prepare an action plan that adequately outlines interviews and observations to be conducted; and, details documents to review during an evaluation of contractor compliance against the requirements of the Project Management System.
- e. Given the results from an analysis of contractor noncompliance, determine the potential implications and describe how to communicate the results to contractor and Department management.
- f. Discuss the project management terminology for which definitions are provided in DOE Order 4700.1, Project Management System.
- g. Discuss in detail the roles played by various management levels within the Department as they relate to the Project Management System.
- h. Discuss the purpose of "critical decisions", including the responsible authorities for critical decisions.
- i. Describe the process by which projects are designated.
- j. Prepare a presentation for senior field or headquarters management personnel (e.g., Energy System Acquisition Advisory Board).

- k. Evaluate a project execution plan using the criteria provided in DOE Order 4700.1, Project Management System.
- l. Discuss the requirements that must be met to make a change to a project execution plan.
- m. Discuss the objectives of configuration management and change control.
- n. Discuss the graded approach to each of the following elements of project baseline development:
  - Technical baseline and work scope development
  - Roles and responsibilities
  - Cost estimating
  - Planning and scheduling baseline
  - Cost baseline
- o. Discuss the graded approach to each of the following areas of project performance:
  - Work authorization
  - Performance analysis
  - Reporting

**2.2 Project management personnel shall demonstrate a familiarity level knowledge of the following Department of Energy (DOE) Orders used to support the project management process :**

- **DOE Order 6430.1, General Design Criteria**
- **DOE Order 5700.7, Work Authorization System**
- **DOE Order 1360.1, Acquisition and Management of Computing Resources**
- **DOE Order 4200.1, Competition in Contracting**
- **DOE Order 4320.1, Site Development Planning**
- **DOE Order 4300.1, Real Property Management**
- **DOE Order 5700.2, Cost Estimating, Analysis, and Standardization**
- **DOE Order 5100.3, Field Budget Process**
- **DOE Order 5160.1, Reprogramming, Restructuring, and Appropriation Transfer**
- **DOE Order 2200.4, Accounting Overview**
- **DOE Order 2200.6, Financial Accounting**
- **DOE Order 2200.9, Miscellaneous Accounting**

Supporting Knowledge and/or Skills

- a. Discuss the purpose, scope, and application of the listed Orders. Include in this discussion key terms, essential elements, and personnel responsibilities and authorities.

- b. During the planning and execution of an assigned project, identify the proper source documents necessary to manage the project effectively.

**2.3 Project management personnel shall demonstrate a familiarity level knowledge of the following Department of Energy (DOE) Orders.**

- **DOE Order 5440.1, National Environmental Policy Act Compliance Program**
- **DOE Order 5480.1, Environment, Safety, and Health Program for DOE Operations**
- **DOE Order 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements**
- **DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards**

Supporting Knowledge and/or Skills

- a. Discuss the purpose, scope, and application of the listed Orders, policies, and circulars. Include in this discussion key terms, essential elements, and personnel responsibilities and authorities.
- b. Discuss the purpose and content of each of the following environmental documents and their interaction with the project management system:
  - Environmental Impact Statements
  - Environmental Assessments
  - Safety Analysis
  - Categorical Exclusions
  - Finding of No Significant Impact (FONSI)
- c. Discuss the contractor's responsibilities for environmental safety and health protection as stated in the above documents.
- d. Describe the development of the Environment, Safety and Health Plan and the Environmental Research Plan. Explain their use in the preparation of the environmental and safety component of the Project Execution Plan.

**2.4 Project management personnel shall demonstrate a familiarity level knowledge of Department of Energy (DOE) Order 5480.21, Unreviewed Safety Questions.**

Supporting Knowledge and/or Skills

- a. Discuss the reasons for performing an Unreviewed Safety Question determination.
- b. Define the following terms:

- Accident Analyses
  - Safety Evaluation
  - Technical Safety Requirements
- c. Describe the situations for which a safety evaluation is required to be performed.
- d. Define the conditions for an Unreviewed Safety Question.
- e. Describe the responsibilities of contractors authorized to operate defense nuclear facilities for the performance of safety evaluations.
- f. Describe the action(s) to be taken by a contractor upon identifying information that indicates a potential inadequacy of previous safety analyses or a possible reduction in the margin of safety as defined in the Technical Safety Requirements.
- g. Discuss the action(s) to be taken if it is determined that an Unreviewed Safety Question is involved.
- h. Discuss the qualification and training requirements for personnel who perform safety evaluations.

**2.5 Project management personnel shall demonstrate a familiarity level knowledge of the Technical Safety Requirements as described in Department of Energy (DOE) Order 5480.22, Technical Safety Requirements.**

Supporting Knowledge and/or Skills

- a. Discuss the purpose of Technical Safety Requirements.
- b. Describe the responsibilities of contractors authorized to operate defense nuclear facilities for Technical Safety Requirements.
- c. Define the following terms and discuss the purpose of each:
- Safety Limit
  - Limiting Control Settings
  - Limiting Conditions for Operation
  - Surveillance Requirements
- d. Describe the general content of each of the following sections of the Technical Safety Requirements:
- Use and Application
  - Safety Limits
  - Operating Limits
  - Surveillance Requirements

- Administrative Controls
  - Basis
  - Design Features
- e. Discuss the approval requirements for Technical Safety Requirements for new facilities and subsequent changes to the Technical Safety Requirements.
- f. Discuss the possible source documents that may be used in developing Technical Safety Requirements.
- g. Discuss the conditions that constitute a violation of the Technical Safety Requirements and state the reporting requirements should a violation occur.

**2.6 Project management personnel shall demonstrate a familiarity level knowledge of Nuclear Safety Analysis Reports as described in Department of Energy (DOE) Order 5480.23, Nuclear Safety Analysis Reports.**

Supporting Knowledge and/or Skills

- a. Discuss the four basic purposes and objectives of Nuclear Safety Analysis Reports.
- b. Describe the responsibilities of contractors authorized to operate defense nuclear facilities for the development and maintenance of a Nuclear Safety Analysis Report.
- c. Define the following terms and discuss the purpose of each:
- Design Basis
  - Engineer Safety Features
  - Safety Analysis
- d. Describe the requirements for the scope and content of a Nuclear Safety Analysis Report and discuss the general content of each of the required sections of the Report.
- e. Discuss the approval requirements for the Nuclear Safety Analysis Report for new facilities and subsequent changes to the Report.
- f. Discuss the uses that contractor management makes of Nuclear Safety Analysis Reports.

**2.7 Project management personnel shall demonstrate a familiarity level knowledge of the following laws related to environmental protection, safety and health:**

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**
- **Resource Conservation and Recovery Act (RCRA)**
- **National Environmental Policy Act (NEPA)**
- **Clean Water Act (CWA)**

- **Clean Air Act (CAA)**
- **Toxic Substances Control Act (TSCA)**

Supporting Knowledge and/or Skills

- a. Discuss the purpose, scope, and application of the listed acts. Include in this discussion key terms, essential elements, and personnel responsibilities and authorities.
- b. Discuss the contractor's responsibilities for environmental safety and health protection, as stated in the above documents.
- c. Determine the potential implications of contractor noncompliance with the environmental safety and health protection requirements of the documents listed above, and describe how to communicate the results to contractor and Department management.
- d. Discuss the application of the listed environmental protection acts to a project during the conceptual, execution, acceptance, operations, and close-out phase of the project.

**2.8 Project management personnel shall demonstrate a familiarity level knowledge of the Occupational Safety & Health Act (OSHA) requirements contained in the following documents:**

- **Department of Energy (DOE) Order 5480.9, Construction Project Safety and Health Management**
- **29 CFR 1910, Occupational Safety and Health Standards**
- **29 CFR 1926, Safety and Health Regulations for Construction**

Supporting Knowledge and/or Skills

- a. Discuss how the Occupational Safety & Health Act (OSHA) applies to and impacts Department projects.
- b. Identify the requirements in the Occupational Safety & Health Act (OSHA) that form the basis of authority for project management personnel in the oversight and management of a project.
- c. Discuss the project manager responsibilities set forth in DOE Order 5480.9, Construction Project Safety and Health.
- d. Discuss the construction contractor's responsibilities under DOE Order 5480.9, Construction Project Safety and Health for each of the following:
  - Establishing a safety program
  - Worksite presence during work activities
  - Compliance by subcontractors

- e. Discuss the requirements for the performance of a Preliminary Hazard Analysis (PHA) and an Activity Hazard Analysis (AHA). Include in the discussion each of the following elements:
  - Responsibility for the performance of these analyses
  - Purpose and content of the analyses
  - When the analyses are required to be performed
- f. Discuss the contractor's responsibility for providing necessary training to employees in the area of safety and health on the worksite.
- g. Discuss the project manager's responsibility for on-site safety and health inspections.
- h. Discuss the contractor's required response to an identified safety and/or health hazard.

### 3. ADMINISTRATIVE

**NOTE 1: When Department of Energy (DOE) directives are referenced in the qualification standard, the most recent revision should be used.**

**3.1 Project management personnel shall demonstrate a familiarity level knowledge of the Project Reporting and Assessment system in accordance with Department of Energy (DOE) Order 4700.1, Project Management System.**

Supporting Knowledge and/or Skills

- a. Discuss the documentation and reporting requirements for each of the following project status reviews:
  - Headquarters reviews
  - Project reviews
  - Field reviews
- b. Given an assigned project, prepare and submit the required reports.
- c. Discuss the requirements for Project Managers' Progress Reports.
- d. Discuss the submittal requirements for reports prepared by project managers.

## 4. MANAGEMENT, ASSESSMENT, AND OVERSIGHT

**NOTE 1: When Department of Energy (DOE) directives are referenced in the qualification standard, the most recent revision should be used.**

### 4.1 Project management engineering personnel shall demonstrate a familiarity level knowledge of the Department's project management system objectives and management policy .

#### Supporting Knowledge and/or Skills

- a. Describe the project management system's approach to management with respect to the assignment of authority, responsibility, and accountability for a project.
- b. Discuss the significance of baseline establishment, baseline change control, and contractor reporting in proper project management.
- c. Discuss the categories of projects under the project management system, including the criteria for assigning a project in to a category and the difference in requirements between the categories.
- d. Define the terms "project" and "program" and discuss the relationships between them.

### 4.2 Project management personnel shall demonstrate a familiarity level knowledge of the Department's project management system management roles, responsibilities, authorities, and organizational options.

#### Supporting Knowledge and/or Skills

- a. Describe the line organization chain from the Secretary of Energy to the Project Manager.
- b. Discuss the purpose and responsibilities of the Energy System Acquisition Advisory Board (ESAAB).
- c. Discuss events that will "trigger" an independent review of a project.
- d. Discuss the role and responsibilities of each of the following positions/organizations in the project management system line organization:
  - Program Secretarial Officer
  - Heads of Field Organizations
  - Project Manager
  - Departmental Support Organizations
  - Acquisition Executive
  - Management and Operating (M&O) Contractor

- e. Describe the following project organization options and the circumstances under which each may be used:
  - Matrix support
  - Dedicated
- f. Describe the relationship between the project life cycle and critical decision points.

**4.3 Project management personnel shall demonstrate the ability to interpret and prepare project initiation and planning documentation .**

Supporting Knowledge and/or Skills

- a. Describe the project development process and the events leading up to project formulation.
- b. Discuss the purpose of "strategic planning" in the Department's project management system.
- c. Discuss the purpose and content of each of the following:
  - Project Mission Need
  - Project Execution Plan
- d. Discuss the purpose and uses of a work breakdown structure (WBS) in the project planning process.
- e. Prepare a work breakdown structure (WBS) for a project.

**4.4 Project management personnel shall demonstrate a familiarity level knowledge of the project budget process described in Department of Energy (DOE) Order 4700.1, Project Management System.**

Supporting Knowledge and/or Skills

- a. State the purpose, and describe the process for project validation.
- b. Discuss the purpose and functions of the Field Work Package Proposal and Authorization System (WPAS).
- c. Describe the cost estimating and contingency estimating processes.
- d. Describe the various cost estimating methods and the types of cost estimates.
- e. Review and evaluate a cost estimate for a project including a description of the basis for the cost estimate.
- f. Evaluate contractor estimates for input to project budget planning.

- g. Establish funding determinations and allocation by funding category.
- h. Describe the preparation and content of the following budget documentation:
  - Construction Project Data Sheet (CPDS)
  - Activity Data Sheet (ADS)
- i. Formulate responses to changes in funding levels.
- j. Describe the process for reprogramming funds.
- k. Prepare, present, and manage the project budget validation process.
- l. Develop, review, and endorse annual budget requests for projects.
- m. Describe the Department's internal review budget cycle and the budget process for a typical capital funded line item project.

**4.5 Project management personnel shall demonstrate a familiarity level knowledge of the preparation of acquisition strategy descriptions and advance acquisition or assistance plans (AAAP).**

Supporting Knowledge and/or Skills

- a. Describe the purpose of the acquisition strategy description in the project execution plan.
- b. Prepare an acquisition strategy description for a project execution plan.
- c. Describe the purpose of the advance acquisition or assistance plan (AAAP).
- d. Prepare an advance acquisition or assistance plan (AAAP) for a project execution plan.
- e. State the purpose and explain the functions of a business strategy group.

- 4.6 Project management personnel shall demonstrate a familiarity level knowledge of the National Environmental Policy Act documentation required for a project to ensure that all project activities are carried out in compliance with Federal, state, and local regulations, laws, and standards.**

Supporting Knowledge and/or Skills

- a. Discuss the general environmental compliance principles in the Department of Energy Environmental Compliance Guide and the integrated environmental compliance planning strategy termed "phased compliance."
- b. Determine the potential implications of contractor noncompliance with the National Environmental Policy Act (NEPA) documentation required for a project, and describe how to communicate the results to contractor and Department management.
- c. Develop the National Environmental Policy Act (NEPA) strategy for a project execution plan.

- 4.7 Project management personnel shall demonstrate a familiarity level knowledge of the process for the evaluation of a project mission need.**

Supporting Knowledge and/or Skills

- a. Explain how project needs are related to program mission needs.
- b. Describe the process for evaluating a project in terms of cost, schedule, and technical objectives.
- c. Evaluate the plan for project for project organizational involvement including Field organizations, laboratories, universities, industrial concerns, Headquarters, and other agencies.
- d. Describe how project risk assessment plays a role in evaluating project mission needs.

- 4.8 Project management personnel shall demonstrate the ability to prepare a project Technical Plan and to establish project baselines against which progress of the project and the effectiveness of its management can be measured.**

Supporting Knowledge and/or Skills

- a. Develop project technical objectives in quantitative terms.
- b. Describe the "technology readiness" for implementing the project.
- c. Describe the specific scientific, technological, or engineering approaches or processes to be used in meeting the project performance objectives.

- d. Describe the major project events, technical activities, and decision points and authorities that occur during each phase of the acquisition process.
- e. Develop a flow or logic diagram that illustrates project element sequencing and interdependencies.

**4.9 Project management personnel shall demonstrate the ability to prepare a project risk assessment and to establish project baselines against which progress of the project and the effectiveness of its management can be measured.**

Supporting Knowledge and/or Skills

- a. Perform an assessment of project risks that identifies critical systems, subsystems, and other factors that require focused work and resolution.
- b. Identify the types of risks that are addressed in a project risk assessment.
- c. Evaluate the assessed level of risk.
- d. Describe the basis for the risk assessment.
- e. Identify the critical project elements that contribute to the risk.
- f. Identify the consequences of the risk.
- g. Develop activities and alternatives to minimize the risk.
- h. Identify the stage(s) of the project in which the risk exists.

**4.10 Project management personnel shall demonstrate the ability to prepare a Project Execution Plan.**

Supporting Knowledge and/or Skills

- a. Evaluate contractor-proposed project management plans.
- b. Review and evaluate contractor-submitted work plans.
- c. Develop budget and schedule forecasts.
- d. Evaluate and/or develop the business/procurement strategy for a project.
- e. Establish appropriate levels of competition, alternate sources of procurement, proper incentive structures, and performance evaluations based on a review of the advance acquisition plan.
- f. Describe the systems engineering approach in project management.
- g. Develop a systems engineering plan.

- h. Describe the process for generating the configuration management plan.
- i. Develop adequate control systems to monitor a project.
- j. Establish performance measurement criteria and methods.
- k. Develop a resource loaded, time based, CPM schedule.
- l. Determine corrective actions to be taken to prevent a project schedule slip or cost increase.
- m. Perform a value engineering assessment.

**4.11 Project management personnel shall demonstrate a working level knowledge of project organization requirements and structure.**

Supporting Knowledge and/or Skills

- a. Define Department and contractor project management organizational roles, responsibilities and authorities.
- b. Define resource requirements, including matrix support when appropriate, and prepare staffing plans.
- c. Review and evaluate organizational structures, including staffing and resource requirements.
- d. Identify and coordinate other Departmental elements such as: program offices; environment, safety and health; security; contracts; and budget and finance.

**4.12 Project management personnel shall demonstrate the ability to manage cost, schedule, and technical baselines to assure that changes are defined, documented, and approved.**

Supporting Knowledge and/or Skills

- a. Discuss the purpose of the conceptual design report in deriving initial baselines for scope, cost, and schedule.
- b. Describe the purpose and functions of the Baseline Change Control Board (BCCB).
- c. Describe the reporting requirements for baseline change control.
- d. Describe the Department's decision-making process for baseline changes.
- e. Evaluate the adequacy and accuracy of a Baseline Change Proposal.
- f. Ensure the configuration management and baseline change control processes are integrated.

- g. Monitor cost, schedule, and technical baseline execution to ensure compliance with the project execution plan.

**4.13 Project management personnel shall demonstrate a familiarity level knowledge of the application of system engineering management principles to confirm that technical control is integrated with funds, cost, schedule, and performance controls.**

Supporting Knowledge and/or Skills

- a. Discuss the objectives of the system engineering management process.
- b. Describe the application of the system engineering management process to a project. Include in the discussion each of the following elements of the process:
  - Planning
  - Design concepts
  - Technical requirement definition
  - Controls
  - Analysis
- c. Describe the function of a project test and evaluation plan in measuring technical performance to ensure that the technical baseline can be met.
- d. Ensure designs are reviewed for compliance with project and program technical objectives, technical scope, and applicable codes and standards.
- e. Ensure that appropriate independent reviews are conducted during conceptual and execution phases to address constructibility, maintainability, and operability.

**4.14 Project management personnel shall demonstrate a familiarity level knowledge of configuration management principles to satisfy the project's technical and operational requirements.**

Supporting Knowledge and/or Skills

- a. Discuss the objectives of configuration management.
- b. Describe the following elements of configuration management:
  - Configuration identification
  - Configuration control
  - Configuration recording and reporting
  - Waivers and deviations
- c. Discuss the revision process for technical baselines over the life of a project, including an explanation of each of the following terms:
  - Functional requirements baseline
  - Technical requirements baseline

- d. Ensure configuration management requirements are implemented.
- e. Ensure the configuration management and baseline change control processes are integrated.

**4.15 Project management personnel shall demonstrate the ability to define and ensure effective implementation of required Quality Assurance activities to be established and implemented by the contractor.**

Supporting Knowledge and/or Skills

- a. Discuss the quality assurance measures required for each of the following elements of a project:
  - Design control
  - Procurement control
  - Instructions, procedures, and drawings
  - Document control
  - Control of purchased material, equipment, and services
  - Identification, control, and traceability of materials, parts, and components
  - Control of special processes
  - Inspection
  - Test control
  - Calibration and control of test and measurement equipment
  - Handling, storage, shipping, and preservation
  - Inspection, test, and operating status
  - Non-conformity of material, parts, or components
  - Corrective action
  - Quality assurance records
  - Audits
- b. Describe the quality assurance plan and program.
- c. Ensure the effective implementation of quality assurance activities.

**4.16 Project management personnel shall demonstrate the ability to establish reporting and performance measurement systems to effectively control project execution and verify contractor compliance with requirements for the work breakdown structure, cost and schedule control, and performance reporting requirements.**

Supporting Knowledge and/or Skills

- a. Discuss the purpose, scope, and application of DOE Order 1332.1A, Uniform Reporting System.
- b. Determine the plans and reports for a project that will provide proper visibility of project status during execution, including their frequency and distribution.

- c. Evaluate the contractor's management plan.
- d. Discuss the performance measurement techniques used to promote highly effective planning, management, and control of projects.
- e. Identify project management requirements that the contractor's system must meet.

**4.17 Project management personnel shall demonstrate the ability to maintain cognizance of project status and to prepare and review project manager status reports.**

Supporting Knowledge and/or Skills

- a. Conduct meetings with various project personnel to obtain the status of the project.
- b. Walkdown the project site to obtain first-hand knowledge of the status of project activities.
- c. Participate in design reviews to verify project progress in accordance with plans and specifications.
- c. Prepare one or more of the following types of reports:
  - Project Manager's Progress Report.
  - Project Manager's Quarterly Supplemental Report.
  - Project Manager's Quarterly Report.
  - Project Manager's Annual Report.

**4.18 Project management personnel shall demonstrate the ability to manage a project as the contract administrator or contracting officer's technical representative.**

Supporting Knowledge and/or Skills

- a. Ensure that cost, schedule, and scope requirements are met.
- b. Act as the principal liaison between the contractor and the Department identifying contractor deliverables, objectives, timeliness and any assumptions, constraints, and priorities for deliverables.
- c. Ensure that instructions to the contractor are within the terms of the contract.
- d. Ensure compliance by the contractor with the technical, safety, and administrative requirements of the contract.
- e. Participate in the formulation and approval of plans and schedules.
- f. Arrange for points-of-contact between the construction contractor, other participants, and the appropriate staff.

- g. Ensure continuity in performance and information exchange among the project team participants.
- h. Initiate procurement request packages for contract modifications to the contracting officer.
- i. Discuss the lessons learned from previous projects.
- j. Discuss the function of "tradeoff studies" in achieving design objectives.
- k. Read, interpret, and develop the following aids for project control:
  - GANTT charts (bar chart)
  - Networking techniques (critical path method)
  - Percentage completion curve (S curve)
  - Labor schedules
  - Material schedules
  - Equipment schedules
  - Finance schedules
  - Resource loaded, time based CPM schedules
- l. Review and evaluate the proposed plan for transition to operations as appropriate.
- m. Ensure appropriate planning for the preparation and transfer of project technical documentation to support operations and maintenance.
- n. Conduct design review meetings.
- n. Discuss stop work authority and responsibility for site safety.

**4.19 Project management personnel shall demonstrate familiarity level knowledge of the process and requirements related to interfacing with other agencies, stakeholders, and the public.**

Supporting Knowledge and/or Skills

- a. Coordinate internal and external support as necessary.
- b. Support external auditing groups such as the office of Inspector General (IG) and General Accounting Office (GAO).
- c. Establish effective working relationships and maintain dialogue with internal and external support groups.
- d. Describe the state and local environmental agency interfaces.
- e. Describe the policy for release of information to the public.
- f. Support and/or conduct public hearings as required.

- g. Support responses to congressional inquiries.
- h. Prepare and/or evaluate a stakeholders plan.
- i. Determine who the stakeholders are for an assigned project.
- j. Interface with stakeholders, keeping them informed and receiving their input.

**4.20 Project management personnel shall demonstrate the ability to manage the close out phase of a project and to bring the project to an orderly close.**

Supporting Knowledge and/or Skills

- a. Coordinate close-out plan implementation.
- b. Support post-project reviews.
- c. Review and evaluate contractor claims and changes and support the claims settlement process.
- d. Document lessons learned.
- e. Direct and oversee the preparation of cost closing statements and final cost reports.
- f. Approve cost closing statements and final cost reports.

## EVALUATION REQUIREMENTS

The following requirements shall be met to complete the Department-wide Project Management Functional Area Qualification Standard. The evaluation process identified below serves as a measurement tool for assessing whether the participants have acquired the technical competencies outlined in this Standard.

1. Documented completion of the Department-wide General Technical Base Qualification Standard in accordance with the requirements contained in that standard.
2. Documented completion of the competency requirements listed in this functional area qualification standard. Documentation of the successful completion of these competency requirements may be satisfied by a qualifying official using any of the following methods:
  - Documented evaluation of equivalencies
  - Written examination
  - Documented oral evaluation
  - Documented observation of performance

## CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS

Project management personnel shall participate in an Office/facility/position-specific continuing training and qualification program that includes the following elements:

1. Technical education and/or training covering topics directly related to the duties and responsibilities of project management personnel as determined by line management. This may include courses and/or training provided by:
  - Department of Energy
  - Other Government agencies
  - Outside vendors
  - Educational institutions
2. Training covering topics that address identified deficiencies in the knowledge and/or skills of project management personnel.
3. Training in areas added to the Project Management Functional Area Qualification Standard since initial qualification.
4. Specific continuing training requirements shall be documented in Individual Development Plans (IDPs).